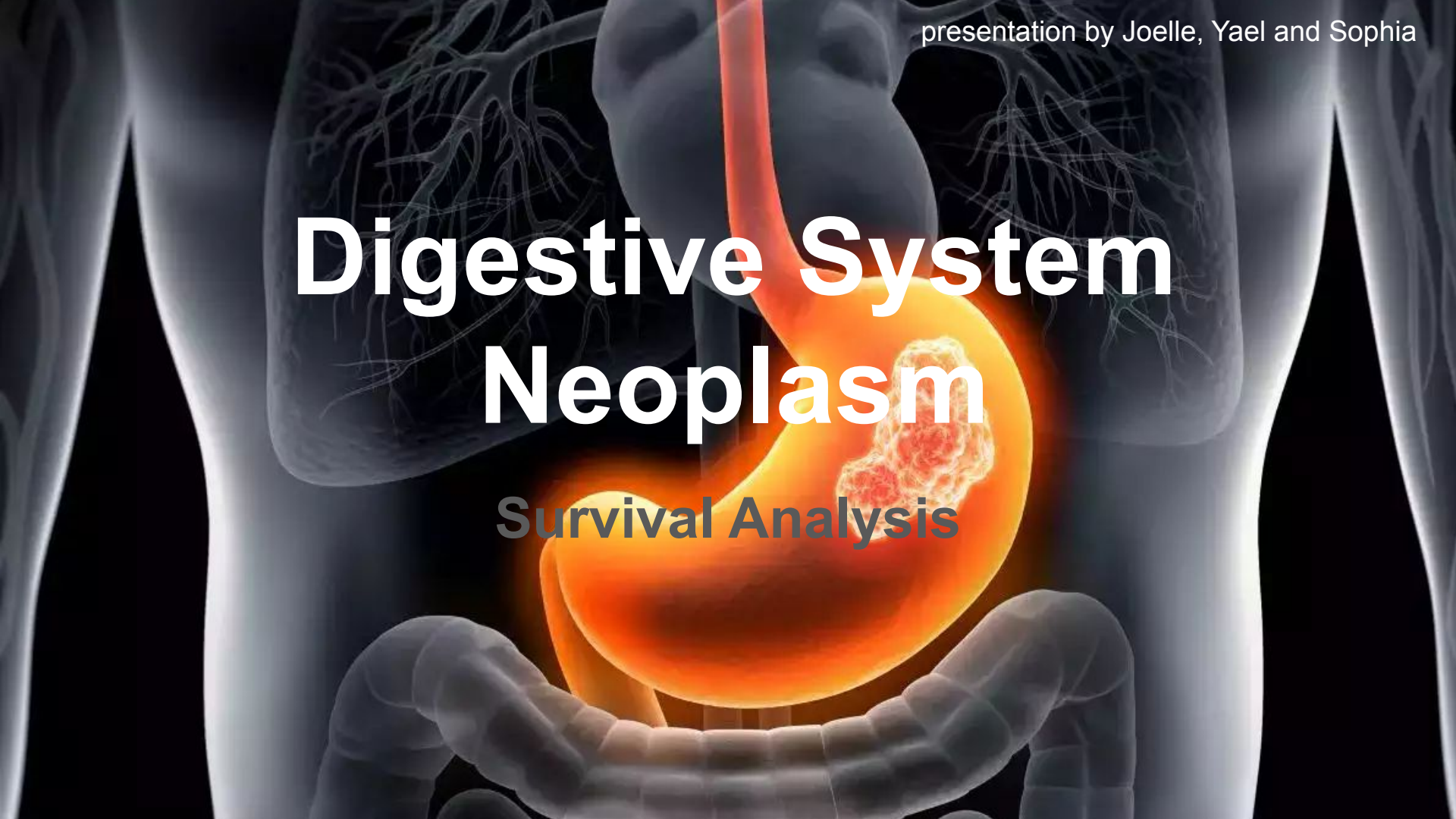


# Digestive System Neoplasm

Survival Analysis



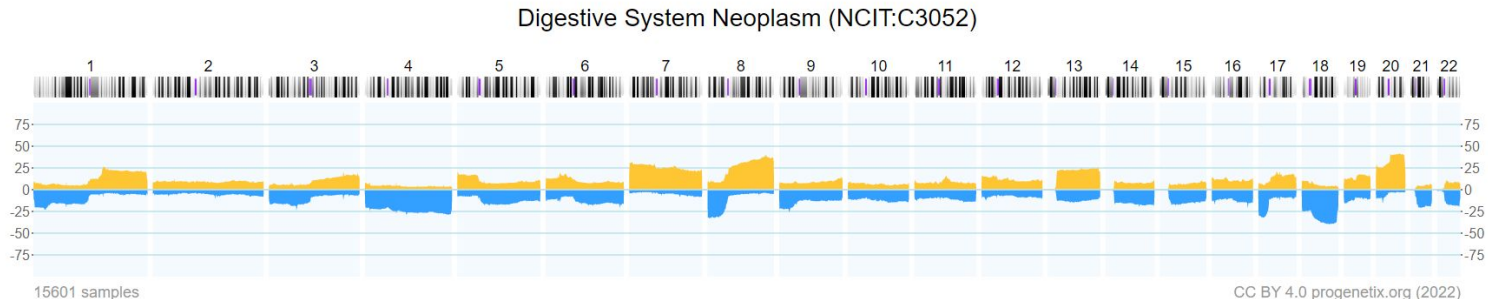
# Motivation

- improve the prevention, detection and treatment of cancer in the future.
- Gene duplication and deletion are common in cancer cells and contribute to cancer cell growth, drug sensitivity and resistance
- Genes like *ERBB2* promote cancer progression (oncogene) often experience an abnormal increase in their gene count



# Overview

- Common types: gastric cancer, colorectal cancer, liver cancer, pancreatic and esophageal cancer
- Most frequently diagnosed cancers
- Treatment: surgical resection
- Second leading cause of cancer death
- Genes involved: **TP53**, KRAS, PIK3, ARID1A, **CDKN2A**, SMAD4



# CNV Fractions

TP53 - :

higher fractions of deletions

CDKN2A - :

higher fractions of deletions

MYC + :

higher fractions of duplications

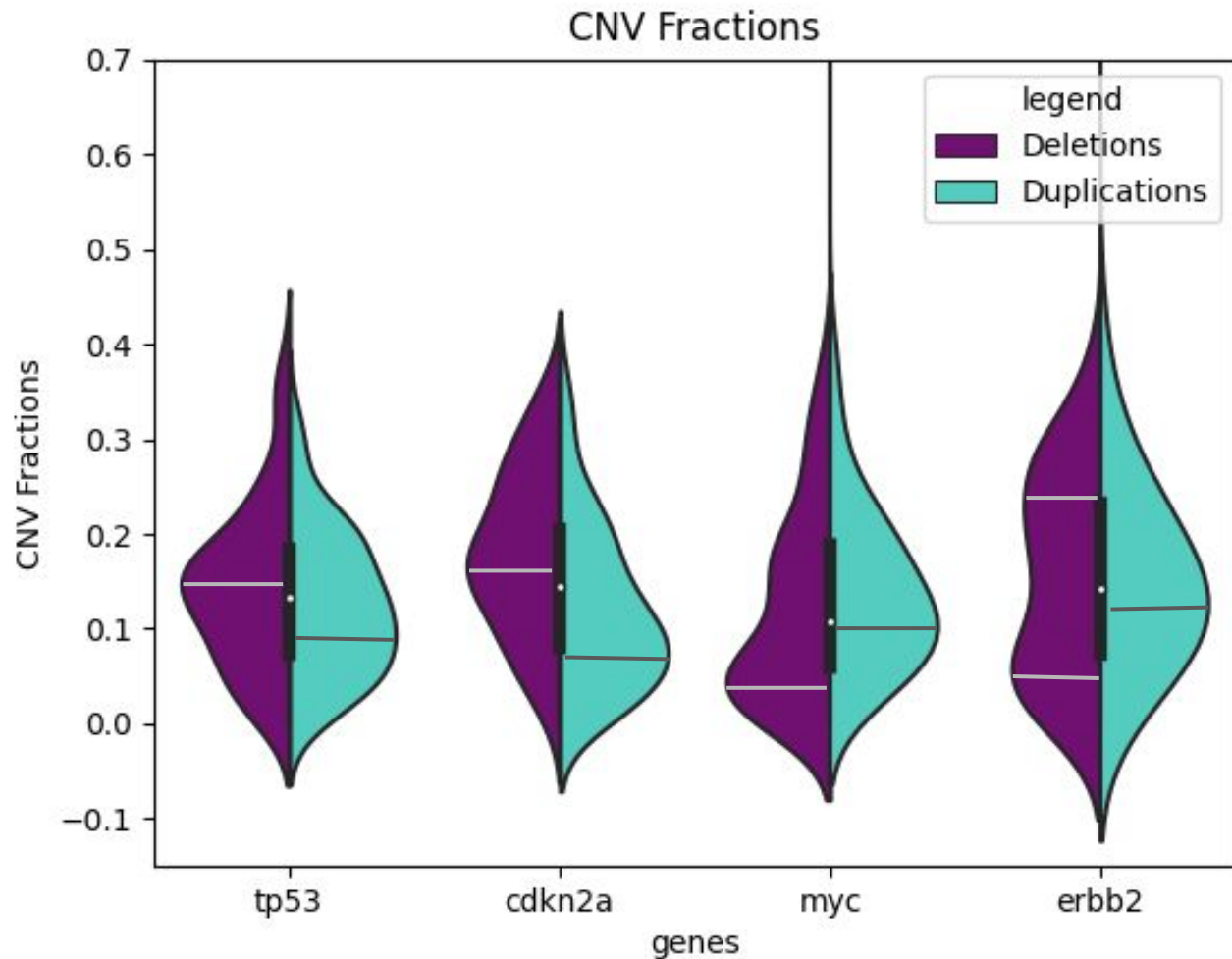
ERBB2 + :

higher fractions of duplications

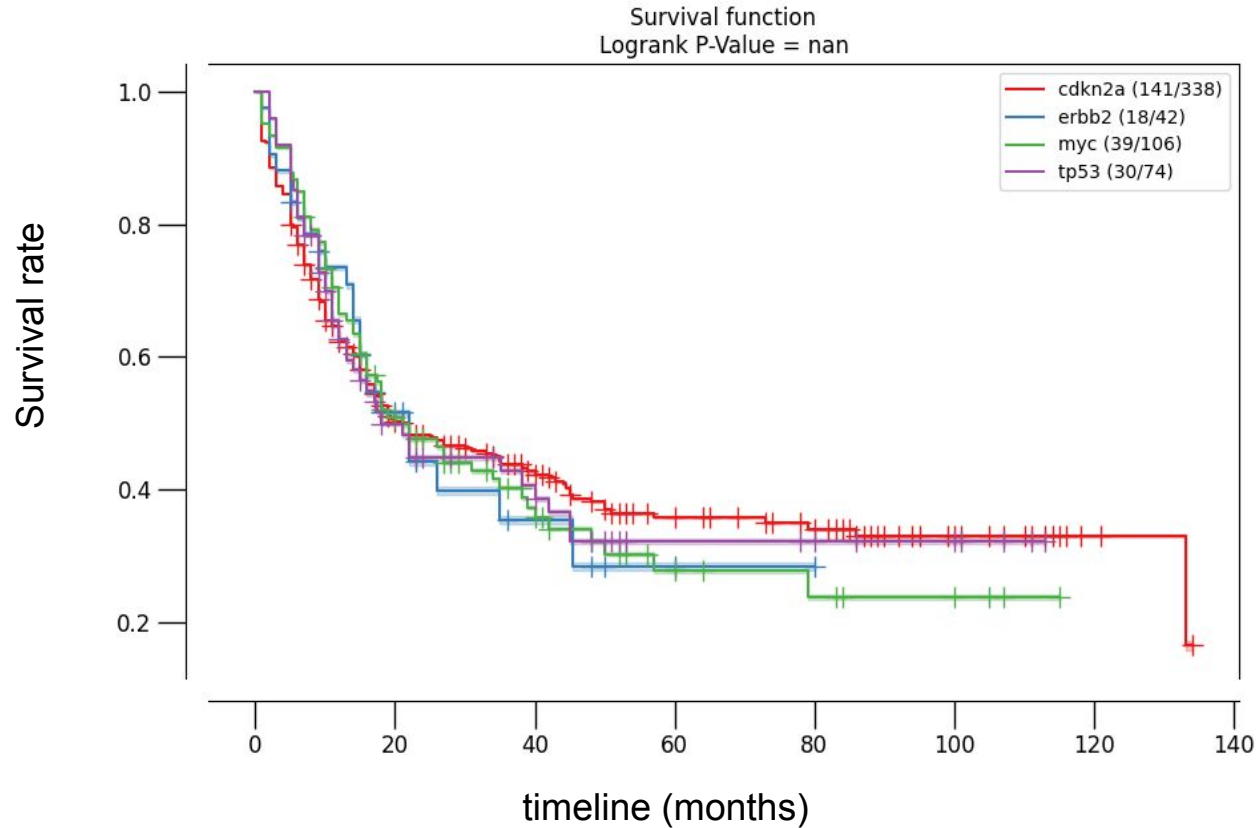
all in all:

almost all fractions 0-40%

not much difference



# Survival function for different genes

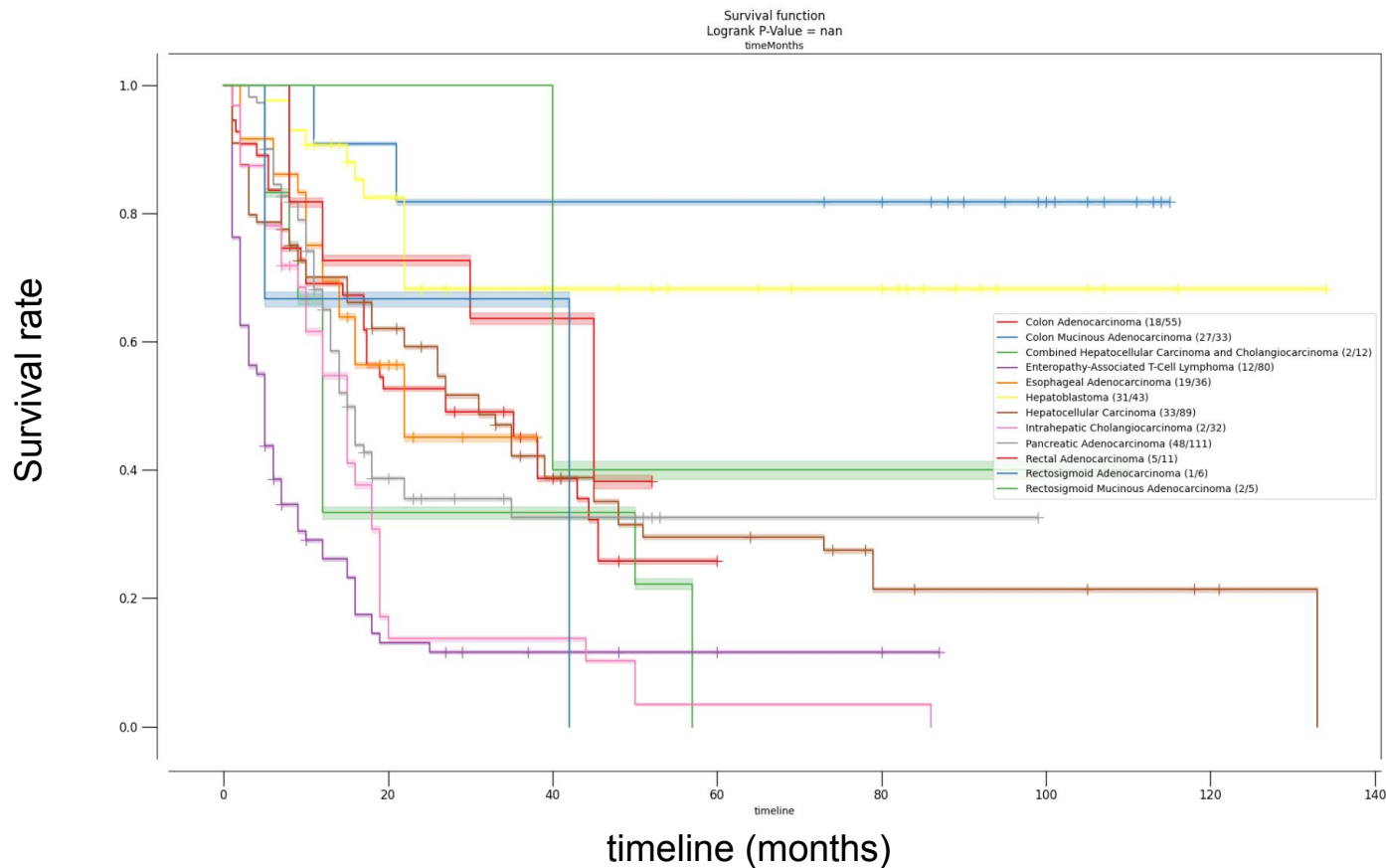


# Tukey-Test

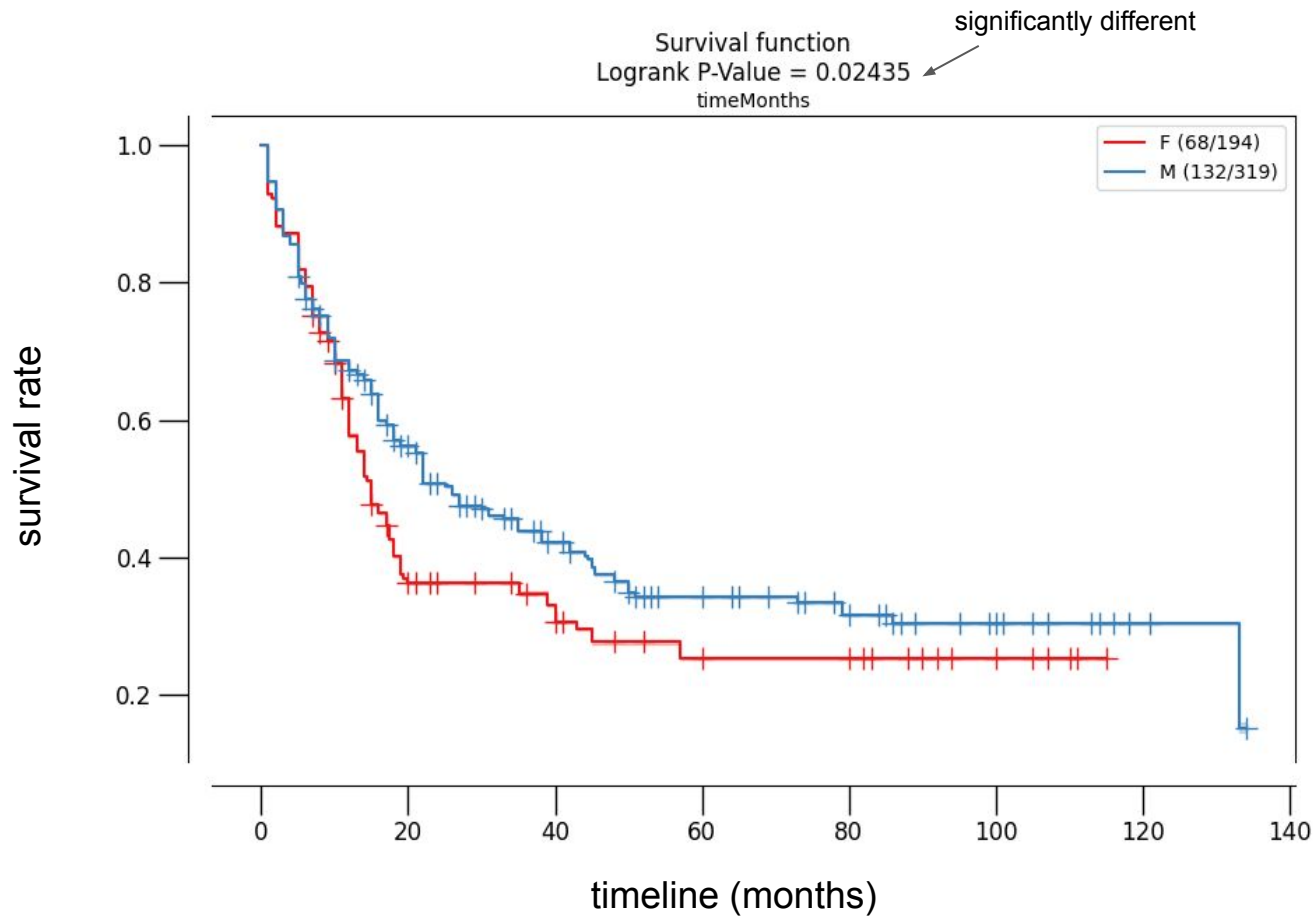
**Tukey's test** compares the means of all samples to the mean of every other samples  
means of survival numbers per gene are not significantly different!

```
Multiple Comparison of Means - Tukey HSD, FWER=0.05
=====
group1 group2 meandiff p-adj  lower  upper  reject
-----
cdkn2a  erbb2    0.0203 0.9952 -0.1992 0.2398  False
cdkn2a   myc     0.0482 0.8328 -0.0988 0.1951  False
cdkn2a  tp53    -0.0123 0.9975 -0.1765 0.152   False
erbb2    myc     0.0279 0.9911 -0.2158 0.2715  False
erbb2   tp53    -0.0326 0.9876 -0.287  0.2219  False
myc     tp53    -0.0604 0.8556 -0.2558 0.1349  False
```

# Survival rate of digestive system cancer types



# survival function sex differences





# Summary and Conclusions

- CNV Fractions play a role in cancer
- genes tested didn't make a big difference in survival rate
- big differences in fatality for different cancer types
- the probability of surviving is higher for men after 15 months

## Outlook

- Finding genes that significantly differ in CNV fraction
- Including types of treatment in the survival rate
- Survival rate according to cancer stage